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BINDURA UNIVERSITY OF SCIENCE EDUCATION
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TOPIC

AN INVESTIGATION OF THE PERCEPTIONS OF SECONDARY SCHOOL MATHEMATICS TEACHERS ON THE IMPLEMENTATION OF CONTINUOUS ASSESSMENT LEARNING ACTIVITIES (CALAs)

BY

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RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS IN HONORS DEGREE IN MATHEMATICS EDUCATION

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DECLARATION FORM

I Chikati Chikati declare that this is my original work that has not been submitted for any degree or examination in any other university and that all the sources I have used or quoted here have been indicated and acknowledged.

Signature: *@chikati*   **Date: 17**/01/2023

APPROVAL FORM

The undersigned certify that they have supervised, have read and recommend to the University for acceptance and examination a research project entitled: **AN INVESTIGATION OF THE PERCEPTIONS OF SECONDARY SCHOOL MATHEMATICS TEACHERS ON THE IMPLEMENTATION OF CONTINUOUS ASSESSMENT LEARNING ACTIVITIES (CALAs)** submitted by Chikati Chikati in partial fulfilment of the requirements for the award of the Honors degree in Mathematics Education.

Signature: **Date: 17.01.23**

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DEDICATION

This research project is dedicated to my wife and my daughters

for all the support throughout the study. Without their encouragement, this work would have been next to impossible to accomplish.

ABSTRACT

The major goal of this study was to investigate secondary school mathematics teachers' opinions on the use of CALAs when instructing "O" level mathematics in Marondera District. There were 50 participants in the study, including 10 teachers and 40 students. Despite some evident difficulties in applying them, the researcher's data showed that CALAs in Marondera District were highly helpful to both teachers and students. The study also identified a significant number of obstacles to the successful application of CALAs. The information acquired showed that CALAs were crucial in enhancing learner profiling, eliminating learners' deficiencies, enabling teachers to provide feedback on the learners' progress, and improving teachers' teaching and learning methods. The results also showed that CALAs helped with summative assessment scores, major test preparation, and preparing students for their future employment. The respondents stated once more that if the CALA system was to be used to the benefit of students, it would require thorough monitoring and evaluation. According to the researcher, Curriculum Development and Technical Services (CDTS) should work to appropriately administer CALAs to maintain uniformity and that CALAs should be moderated in all schools in light of the aforementioned findings. In order to prevent teachers from seeing implementing CALAs as an additional burden, the research also recommended that the Zimbabwean government pay teachers appropriately. ZIMSEC and the CDTS should also start providing thorough training for all teachers so that everyone involved in implementing CALAs is aware of what is expected of them. The research was finished in 2022.

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CHAPTER ONE: THE PROBLEM AND ITS SETTING

1.1 INTRODUCTION

The researcher provides a general summary of the study in this chapter. This includes the events that led the researcher to his taking part in the study, the justification for doing so, any related minor issues, and the importance of the study to various stakeholders. The researcher also emphasized study boundaries, obstacles that prevented the study's successful completion, and the conceptual interpretation of important words utilized in this study as the chapter went on.

1.2 BACKGROUND TO THE PROBLEM

Without assessment, it would be extremely difficult for teachers to accomplish many of their instructional goals. Assessment is the cornerstone of all effective teaching and learning, making it a vital tool. Since the beginning of time, assessment in a teaching and learning environment has been regarded as essential to achieving curriculum objectives (Mpofu, 2019). The two primary apportionments of assessment are formative and summative (Madziyire, 2015). Although classroom teachers may favor one of the two over the other, claiming various justifications, both modes of assessment are crucial in gauging academic efforts in mathematics. Continuous assessment (CA), a different type of evaluation that has recently gained popularity, appears to integrate more formative evaluation qualities than summative evaluation (Chakanyuka, 2017). The use of CA as an evaluation technique is common in all secondary schools in Zimbabwe, and it has advantages and disadvantages.

The researcher has noticed that there have been several adjustments to the existing curriculum's assessment methods for students. Summative and formative evaluation methods have been around for a while, but the former tended to get more use than the latter (Mpofu, 2019). Formative assessment can be seen in three phases: prior to instruction, during instruction, and after instruction, claims Chakanyuka (2017). It is frequently mistaken for diagnostic testing when carried out prior to the start of a course. Diagnostic testing is a method frequently employed by educators to determine how much knowledge students have of a certain idea (Ogunniyi, 2014). When a teacher is navigating the syllabus's content throughout a class, Ogunniyi (2014) notes, formative assessment can still be done.

The Ministry of Primary and Secondary Education (MoPSE) declared in March 2021 that the continuous evaluation mechanism must be urgently revived for 2021 applicants. According to the administration, the framework would be used for candidates in grades 7, form 4, and Upper 6 in 2021 (Tshuma, 2020). The program was a part of the newly adopted curriculum for 2015, however it was put on hold due to a shortage of funding, among other issues. There are five CALAs per complete course and a 30% weighting for CALAs in "O" Level Mathematics. Each student should have a learner's profile that includes information about their performance in all CALAs. This shows that ZIMSEC has recognized the need of including coursework in students' final grades (Kadungure, 2021).

The researcher is concerned that while the intention of adopting CALAs is admirable, especially if its principles are followed, there may be certain occasions where these fundamentals are not upheld. In other words, the researcher argues that the goal of implementing CALAs in all Zimbabwean schools, particularly in "O" Level Mathematics, does not place all stakeholders on an equal playing field. Therefore, despite all of the benefits of CALAs, the researcher will work to learn how "O" Level students and their teachers perceive this crucial evaluation instrument in Marondera District, Mashonaland East Province. Thereafter, the researcher would recommend suggestions that would help to instill positive attitudes in teachers towards CALAs, as well as the effective use of CALAs in all schools to maximize learner potentials.

1.3 STATEMENT OF THE PROBLEM

The researcher discovered the issue under inquiry while working in Marondera District of Mashonaland East Province. The researcher observed that there were many issues concerning CALAs in Marondera District, which resulted in a disorganized implementation of them. While it is advantageous in many ways to incorporate students' formative assessment results in addition to ZIMSEC scores, the researcher found that the introduction and implementation of these measures in secondary schools in Marondera District were subject to numerous difficulties that led to widespread criticism from a variety of stakeholders. The researcher also noticed that CALAs were implemented hurriedly, burdened teachers and parents, and met with fierce opposition from teachers' unions, students, parents, and educators. It is against these observations that the researcher was motivated to investigate the perceptions of teachers towards the implementation of CALAs in the teaching of 'O' level Mathematics in Marondera District.

1.4 OBJECTIVES OF THE STUDY

This study aims to:

- Determine perceptions of educators towards CALAs in 'O' Level Mathematics.

- Examine the pros and cons of implementing CALAs in the teaching and learning of 'O' level Mathematics.

- Highlight mechanisms of improving usage of CALAs by educators in 'O' Level Mathematics.

1.5 RESEARCH QUESTIONS

- How do teachers perceive the adoption of CALAs in 'O' Level Mathematics?
- What are the pros and cons of CALAs in 'O' Level Mathematics?
- What mechanisms can be implemented to improve usage of CALAs by teachers in 'O' Level Mathematics?

1.6 SIGNIFICANCE OF THE STUDY

The study's author expects that it will be useful to a wide range of parties, including students, teachers, school administrators, policymakers, curriculum designers, the labour market, and higher education institutions. According to the researcher, when students are exposed to CALAs, they will become more motivated and have higher self-esteem. Regular testing following each mathematical skill is essential for helping students retain what they have learned and receive remedial help for any areas that are challenging them (Mwamwenda, 2014). Additionally, CALA is helpful to students because summative evaluation is frequently an insufficient method of assessment that omits a significant portion of students' prior and terminal experiences.

School administrators, decision-makers, and examining bodies may also understand how important it is to give instructors the abilities they need to accept CALAs with a positive outlook. Therefore, individuals in charge of encouraging educators to use CALAs can learn the right methods for doing so, frequently by sending instructors to workshops, in order to provide objective, reliable results and steer clear of negative attitudes toward CALAs. Additionally,

school administrators may learn about CALA implementation tactics, their responsibilities, and how to oversee, monitor, and support CALAs. By following the suggested assessment processes, which are manageable in practice, curriculum developers may also profit from this study. Those on-the-job market and those in institutions of higher learning may also use results of CALAs to select appropriate candidates for suitable jobs or programs in Mathematics respectively.

1.7 Delimitations

Marondera District of Mashonaland East Province served as the study's location. Only 50 students and 10 Mathematics teachers were employed in this study. The five secondary schools from which the target group for this study was chosen do not include any boarding institutions. The survey was entirely concerned with how teachers of mathematics at 'O' level felt about the recently implemented CALA system. The research was finished in 2022**.**

1.8 Limitations

The researcher would have preferred to conduct this study in a number of Marondera District schools, but he was not able to do so due to time constraints and lack of funding. In order to guarantee the validity and trustworthiness of the results, the researcher used discretion when choosing the population for this study. Again, the researcher relied on his wife and other family members for financial assistance while working feverishly on the weekends to make the most of his limited time and financial resources. The COVID-19 pandemic, which the researcher conducted this study in the midst of, also made data collecting difficult because there were protocols to follow to stop the spread of the deadly disease.

1.9 Definition of terms
CALA – Continuous Assessment Learning Activity (MoPSE, 2015)

Perception – becoming aware of something via the senses (Webster's Dictionary, 2015).

Mathematics – the scientific study of numbers.

1.10 Summary

This chapter mostly focused on what inspired the researcher to feel the need to learn more about instructors' perspectives on continuous assessment in "O" Level Mathematics. The key purposes for conducting this research and the research topics that will be addressed in an effort to discover a solution to the primary issue were both examined. The significance of the study to various stakeholders, the study's boundaries, procedures, and a glossary of essential terms utilized in the study were all closely examined in this chapter.

CHAPTER 2

2.0 REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter explores significant contributions made by earlier educational theorists whose research on CALA analysis continues to have an impact. Aspects to be examined include the background of CA and CALAs, the advantages and disadvantages of the latter as assessment tools, learner and teacher perspectives on CALA adoption, and approaches for enhancing the appearance of CALAs in "O" Level Mathematics.

2.2 MERITS OF USING CALAs IN MATHEMATICS

Because CALA is a cumulative process that involves teaching, assessment, and feedback, if done appropriately at various levels, it encourages students to be interested in the subject. Teachers who use CALAs effectively can significantly increase their students' enthusiasm in their subjects (Moyo, 2021). All students may experience a sense of value if a teacher offers remedial exercises following testing and providing feedback, for instance, and their attitudes toward the subject may improve (Tshuma, 2021). Again, Susanna (2020) acknowledges that CALA fosters methodical study, discourages cramming, promotes active participation, energizes students, and instructs them on how to efficiently prepare for exams.

CALA is frequently used in conjunction with summative evaluation, and the format of CALA exercises can benefit the latter (MoPSE, 2015). This means that if students were exposed to properly planned activities during the CALA process, they will be aware of the types of questions to expect when they write their final exams. Gashaw (2019) adds that students are more likely to adopt positive attitudes and refrain from utilizing unethical methods to increase their grades if they are aware that their course work grades impact their final grade in a course of study. Nitko (2016) contends that taking a single slot test after years of study increases behaviours like cheating and last-minute cramming.

When students are only evaluated at the end of the course through national exams, they tend to get complacent throughout the curriculum and work to fill in any knowledge gaps as quickly as they can in order to be prepared for the final, high-stakes exams (Gashaw, 2019). This not only undermines their anticipated outcomes but also promotes cramming and fact memorization. As a result, by factoring in classwork marks into final grades, CALA aids in

keeping students on track. According to Atkinson (2018), who holds a similar viewpoint, the school and teachers participating in CA usage are motivated to produce capable pupils who can compete in higher education or on the job market.

CALA is one of the most crucial tools for educators to evaluate the effectiveness of their methods for teaching and learning (Madziyire, 2015). This means that teachers will be able to assess the effectiveness of their lessons using the CALA findings. This will motivate them to develop other helpful teaching and learning aids, such as enhancing their teaching and learning episodes with a variety of media to aid memory retention and keep their lessons interesting, lively, and animated, in addition to realigning their methodologies in the event of failure (Chakanyuka, 2017). As a result, CALAs give teachers more freedom to use their imagination and creativity, which benefits their professional development. Likewise, Mangwaya (2021) insists that CALA also puts educators on their toes as they strive to produce exceptional students who are not only innovative and imaginative, but also have demonstrable hands-on abilities.

Another important finding is that Kapambwe (2020) acknowledges that in Zambian schools, CA serves as a precursor to summative evaluation. In other words, CA is a test simulator for state exams that may also be used to assess learners' strengths and shortcomings in other areas that are challenging to assess in a test setting. To that purpose, instructors assess numerous performance-based exercises outside of the exam setting in the classroom (Popham, 2018). For instance, during CALAs, the teacher may decide to assess group or pair work capabilities such as collaboration, leadership, decision-making, team cohesiveness, psycho-motor skills, and other emotional types of behaviour that summative assessment normally ignores (Susanna, 2020). Other skill-related attributes gained through CALAs may stay unknown to the learner's future handler, either in institutions of higher learning or on the job market, if left untapped during the CALA process, especially in mathematics.

The CALA process should conclude with reflection time, a sort of assessment that enables the facilitator to offer helpful feedback on the learner's development (Tayananiswa, 2021). Feedback should be offered both verbally and in writing to address the needs of the entire class as well as individual students. Oral feedback could be given through in-class conversations about the class's overall performance, stressing important topics, offering suggestions and pointers on how to improve performance, or even through motivational speeches or career advice (Kwami, 2021). Additionally, Mpofu (2019) proposes that professors should encourage

students to take notes when oral feedback is permitted so they can develop action plans based on the goals of the feedback. Likewise, CALA enables educators to leave informed feedback on students' solo, pair, or group work after an exercise to inform them of their achievements and flaws (Moyo, 2021). Constructive criticism should also be pleasant and not contain snide remarks that could frustrate students.

2.3 CHALLENGES FACING TEACHERS WHEN USING CA IN MATHEMATICS

For students who are worried about failing, taking tests can be a stressful and frightening experience (Ames, 2021). To ensure that CALAs are reliable and accurate, testing guidelines must be established. The 2015-2022 Mathematics National Syllabus states that a 'O' Level mathematics student must complete five CALAs for a certain exam session (ZIMSEC Mathematics National Syllabus, 2015-2022). The learner is always busy and susceptible to the anxiety, stress, and pressure that come with taking examinations as a result of the abundance of assessment tasks. Similar to this, the teacher should approach CALAs diligently lest the amount of work that needs to be graded appear to be an impossible task. Kadungure (2021) suggests that, in addition to CALAs being susceptible to dishonesty if not properly monitored, educators may also 'doctor' grades to meet deadlines or just to impress different stakeholders.

A sizeable amount of instructional time is lost when evaluation tools are varied and several assessments are needed (Tshuma, 2021). Many public schools illustrate this by finishing up outstanding CALA assessment record books and grading end-of-term tests in the final two to three weeks before the break (Atkinson, 2018). This is not frequently the case in educational settings where summative assessment is the main method and concept consolidation is prioritized over ongoing mark collection. In order to prevent CALAs from limiting the amount of content that learners can understand owing to limited interaction time, assessment instruments and assignments should be kept to a minimum. For instance, if teacher-learner engagement in mathematics is insufficient, the curriculum may not be completed in the allotted time.

According to Chakanyuka (2017), inadequate training for Zimbabwean educators in their CALA process is the cause of a lack of consistency in routinely assessing students. Every school, and thus every instructor, has a unique set of standards for continuously evaluating pupils. As a result of this inconsistency, the CALA process typically varies greatly across the nation. Since the new curriculum was implemented in Zimbabwe in January 2017, there haven't been any recurring workshops or seminars to acclimate practitioners to necessary

characteristics that are nationally uniform, particularly in Mathematics (Mangwaya, 2021). While schools have historically maintained accurate records, the researcher claims that the most pressing issue at this time is the calibre of the assessment tools they employ in order to meet national objectives.

Implementers of CALAs need training on how to use CALA tools with high levels of efficacy, just as national or international examining bodies train staff manning examinations on item development, marking, and moderation (ARTUZ, 2021). According to Chakanyuka (2017), CALA incorporates the entire range of decisions made by the instructor in class to raise student achievement. It goes beyond simply giving learners quizzes and activities. Because of all this knowledge, teachers must receive the necessary CALA training. The researcher asserts that much work needs to be done in Zimbabwe before instructors can be adequately prepared to apply CALA, particularly in mathematics at the "O" level. The myriad of aspects to be addressed to enhance the smooth flow and implementation of CALAs include: manpower upgrading, resource mobilization as well as motivating teachers so that they would develop massive interest in using them in various learning areas.

Due to a number of unforeseen circumstances, transfers and absenteeism are widespread in Zimbabwean schools which has severe effects on CALAs (Chakanyuka, 2017). When a student fails a practical or theory test, CALA's advancement is hindered. Similar to this, moving to a different university may affect a student's profile if national examination boards do not offer uniform evaluation criteria (Atkinson, 2018). The researcher is of the opinion that uniformity can be achieved, especially if districts or provinces elect organizational bodies to create things that follow societal norms. The flow of progressive reporting of the learner's accomplishment may be disrupted by other unforeseen occurrences in Zimbabwe, such as the death of a parent or the loss of a breadwinner's job. Again, a change of school due to unforeseen circumstances may present a new demanding environment for the learner, who may struggle to adjust and acclimate to the new demands (Madziyire, 2015; Mwamwenda, 2014).

Effective CALA implementation seems to be more challenging when teaching in large classrooms (Santrock, 2016). CALAs may work best in environments with a typical teacher-to-student ratio of about 1:35, but they would be impossible to implement without observing its core principles, such as the development of standardized items, moderation, and adequate feedback. Most educators are forced to limit their assessment tools at the price of quality and to omit higher order questions requiring critical thinking and research skills due to high

enrolment numbers (Mangwaya, 2021). Additionally, it's possible that a teacher working with large classes won't be able to control the class well, let alone keep an eye on and manage individual differences (Mwamwenda, 2014). Unruly students have a tendency to take advantage of large classes to engage in cheating, if not outright misbehaviour, so jeopardizing CALA outcomes (Vinga, 2021). Cheating may also cause research work in Mathematics to be distorted due to big classes.

When CALA results are required, teachers frequently quarrel as they attempt to possess students. Teachers have a tendency to sorely need control over pupils during the conclusion of terms, when CALA outcomes should be utilized to grade learners as well as to round off testing and measurement (Mpofu, 2019). Test items are at risk in such circumstances, and there is frequently not enough time for moderation, feedback, and useful remedial and extension work. In contrast to instances where solely summative assessment is prioritized, a lot of time is spent on class delivery and idea consolidation, thus the researcher notices that there isn't a mad dash to get students' grades in at the last minute. In order to meet deadlines for submitting CALA results, teachers from different disciplines may clash as they race to have students for a certain amount of time (ARTUZ, 2021). Due to time restrictions and apprehension about upsetting teachers of other subject areas, some educators submit subpar work.

2.4 TEACHERS' AND LEARNERS' PERCEPTIONS OF CALAs

The CALA process as a whole is complex, and the teacher is frequently required to do laborious duties such item selection for test preparation, planning, efficient test supervision, marking, feedback, remediation, and extension when necessary (Kadungure, 2021). Time is needed for all of the aforementioned tasks, especially when lesson delivery is included into the equation. As a result, many educators and learners now prefer to use state-wide standardized tests instead of CALAs. When CALA instruments are not governed or controlled by a nationally recognized examination board, other educators frequently use subpar criteria to assign learners CALA marks (Moyo, 2021). In another incriminating conclusion by Nitko (2015), educators may ignore other crucial topics due to time constraints or for fear of receiving negative feedback from students, depriving the latter of successful skill learning.

CALA gives the impression that students are constantly being watched, which makes people uneasy and makes them fear exams in general. According to Vinga (2021), despite the fact that CALA gradually increases students' confidence in taking exams, the repeated collection of their grades makes them anxious and restless. Furthermore, Madziyire (2015) maintains that

instances of failure in prior examinations and exercises cause students to become very anxious and agitated, which compels teachers to give students mostly feasible tasks to do during the CALA process. However, Tayananiswa's (2021) ideas are valid in this case since he claims that routinely evaluating students using well-designed CALA instruments is a procedure that can help students create a cumulative mass of knowledge based on what they have learned in earlier episodes.

To uphold CA's ethical standards and improve the image of CALAs in Zimbabwe, supervision, monitoring, and help should be added to the CALA program (2021). Teachers, on the other hand, think that the kind of supervision they picture is not currently done in a formal manner and that doing so will obstruct and hinder CALA's development. Since CALAs appear to have been in place for a long time in Zimbabwean secondary schools, there is no room for educators to make mistakes and few opportunities to provide them with support when they are found to be lacking (Atkinson, 2018). Teachers thus perceive CALA as a monstrous entity devoid of any knowledge that could aid in their professional advancement.

The secondary school teacher in Zimbabwe views CALA as a burden that can be reduced by using summative assessment because of a lack of training. Given the teacher's already extensive list of duties in the classroom, CALA is perceived as a burden (Madziyire, 2015). Teachers must go above and beyond, even marking students' assessment tasks at home, risking their social wellbeing, in order to fully implement CALAs because many rural schools have both few resources and unusually large classrooms (Mpofu, 2019). The CALA procedure ultimately overburdens educators, who should be often engaged in the right preparation of other pertinent activities for pupils. Teachers may be forced to quit their regular teaching schedule in order to deal with the constant CALA assessment loads. The researcher also requests that the instructor participate in the discussions with all relevant parties to develop the standards and models for applying CALA in mathematics at "O" level. CALA should not be forced onto the teacher as a result; rather, it should be carried out with the instructor aware of his major responsibilities (Quansah, 2018).

2.5 WAYS OF IMPROVING CALAs IN 'O' LEVEL MATHEMATICS

To maintain uniformity, CALA should be carried out using comparable schedules and responsibilities across the nation. The 2015–2022 Mathematics ZIMSEC National Syllabus gives CALA a weight of 30% and calls for five CALA assessments per examination session. The researcher thinks that these activities should be planned on a monthly basis if the CALA

process is to follow a regular pattern across the nation. All schools should receive even anticipated practical and project assignments in a consistent way to help the nation accomplish its uniform and standardized objectives (Chakanyuka, 2017). Additionally, it is important to regularly monitor CALA timeframes and responsibilities to make sure that schools do not deviate from the established parameters.

The use of group activities, class assessments, and project work shouldn't merely be a habit for formative assessment; rather, it should attempt to accomplish the core objectives of the revised curriculum in a variety of ways (Vinga, 2021). The supporters of the new curriculum concur that it takes a competency-based approach and emphasizes what learners can do rather than what they already know. It follows that, for instance, a variety of abilities, including teamwork, cooperation, and decision-making, are demanded of students, while personal qualities like memory retention and self-discovery are targeted by class exams (Santrock, 2016; Mwamwenda, 2014). Similar to this, students working on projects are supposed to acquire teamwork, research, critical thinking, and problem-solving skills that will help them in their future careers.

To establish consistent and precise guidelines that can be used in all schools, adequate moderation at the national level is necessary for CALA to achieve its goals. Teachers are more prone to utilize faulty assessment methods that fall short of targeted instructional goals when CALA activities are not moderated. According to Quansah (2018), moderation is a strategy used to guarantee that the reliability of the marks given to students and the quality of the assessment tools are unquestionable. According to Mpofu (2019), CALA supervisors should be on hand to monitor the methods used by various schools to execute CALAs rather than to identify problems. This is done to ensure that the assessment tool and its findings are reliable, accurate, and authentic.

There is need to reduce the number of student assessments so that they are available to all secondary schools in Zimbabwe, as there appear to be problems hindering the proper implementation of CALAs, such as a lack of sufficient time and resources (Chakanyuka, 2017). Once more, private schools decide to have their curricula linked with international test standards due to the variation in the number of assessments provided by different schools. It's important to keep in mind, though, that in Zimbabwe, CALA is used in conjunction with the ZIMSEC summative exams.

One of the greatest ways to obtain convincing and reliable data regarding CALAs is to keep class numbers as small as possible, as recommended by prominent educators. Class sizes compromise the validity of CALA results since teachers sometimes rush through students' assignments in order to meet deadlines, changing other aspects of the teaching and learning scenario including resource allocation and the learning environment. The instructor will undoubtedly be able to employ all of the CALA ideas with easily if teacher to student ratio is kept at or below 1: 30. (Dokora, 2015). According to the study, this is in sharp contrast to what happens in Zimbabwean schools, where there may be up to sixty children in a single class and one teacher.

Chakanyuka (2017) argues that the Ministry of Education, Sport, Art, and Culture should be in charge of ensuring that teachers in charge of enforcing CALAs as a formative evaluative tool receive adequate training before implementing the program in light of his observations of the difficulties facing CALA integration in Zimbabwean secondary schools. This makes it possible for all schools throughout the country to start off on an equal footing and employ the same assessment guidelines (Ogunniyi, 2014). Sadly, the study finds that CALA was implemented in Zimbabwean schools without the appropriate resource mobilization and training. The majority of instructors have been required to utilize CALAs, but they are not aware of fair and open evaluation standards that may be applied nationally to ensure consistency.

2.6 SUMMARY

Some of the most crucial facets of CALAs were examined in this chapter. The principles of CALA, its benefits and drawbacks as a method of assessment, and how Mathematics teachers in secondary schools in Zimbabwe have applied it at "O" Level were also examined. The chapter also examined the perspectives of educators and students on CALAs, as well as the strategies that different stakeholders might employ to enhance the use of CALAs as an evaluation tool and, as a result, develop favorable views towards the system among both educators and students.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1Introduction

The procedures and strategies the researcher employed to gather data are described in this chapter. This includes the research strategy the researcher selected. It is also necessary to talk about the research design's benefits and drawbacks. The target demographic, the sample, the sampling procedure, as well as the benefits and drawbacks of the research tools utilized to gather data for this study are all examined in this chapter. The method for gathering data, the strategies for data analysis and interpretation, and ethical concerns enclose the information in this chapter.

3.2. Research Design

A research design, according to Best and Khan (2018), is a plan that directs the researcher in gathering, examining, and interpreting observable data. For this study, the researcher used a mixed-approach descriptive survey research design. The descriptive survey method gave the researcher the chance to see and interact with participants in-person. It worked best as a tool for idea generation, establishing theories, and developing solutions that the researcher ultimately chose to test statistically. Mixed research aims to comprehend a certain situation or subject from the viewpoint of the local populace. (Pugh & Phillips, 2016; Punch, 2015). It is also effective in obtaining cultural behaviors in the social context of particular populations (Creswell, 2014). The researcher chose the mixed approach because it helped to gain new perspectives on things about which a lot is already known and gain new more in-depth information that was difficult to solely convey either quantitatively or qualitatively.

3.**3 Target Population**

A population is any group of people who the researcher is interested in and that share one or more traits, according to Best and Kahn (2018). The writers mentioned above go on to say that the population could consist of people of a specific type or a smaller subset of that type. In research, a population is therefore the intended source of knowledge, particularly on values and attitudes. A population, according to Fraenkel and Wallen (2016), is a group of people from which a sample is taken. Mathematics teachers from the five secondary schools that were sampled for this study were part of the researcher's population in this study.

3.4 Sample

People chosen from a wider group of people known as the population make up the sample. A sample is a group in a research study from which information is gathered, according to Fraenkel and Wallen (2016). The sample for this study consisted of 60 individuals, including 10 teachers and 50 students. Boys and girls made up the 50 students in order to accurately represent the perspectives of both sexes. Again, for gender parity, both males and females made up the teacher population.

3.5 Sampling Procedures

Instead of examining the entire population, a small sample carefully selected from a big target group saves time and money (Creswell, 2014). Sampling is the systematic method of choosing a group of people for research so that the chosen people would equally represent the broader group, making it simpler to draw conclusions about the entire population (Wandelt, 2015). To select participants for this study, the researcher used both basic random sampling and purposeful sampling. Purposive sampling, as defined by Phillips & Pugh (2016), is the process of choosing participants for a study based on a certain trait, in this case, the fact that they are mathematics teachers. To prevent prejudice, the 60 participants were also picked at random. According to Borg and Gall (2019), random sampling is precisely the process of choosing people from a population so that every sample of a given size has an equal chance of being chosen. Furthermore, according to Best and Kahn (2018), in a basic random sample, each person is given an equal chance to be chosen and each decision is made independently of all previous decisions. Because it allowed the researcher to perform inferential statistics on the data, random sampling was favoured.

In order to get the required sample of 50 pupils and 10 teachers, the researcher mingled 60 even numbers on little manila cards with odd numbers in small boxes. The potential participants were then told to choose a number at random, without substitution. People who made even-numbered selections were included in the study, whereas people who made odd-numbered selections were excluded. The researcher thought a randomly selected sample was the best for this study because no potential responders felt disfavored during the selection process.

3.6 Research Instruments

These are the resources the researcher utilized to compile the research's data. Borg and Gall (2019) define research instruments as tools used in the data collection phase of a research project. In order to gather data, the researcher employed the triangulation method, using three different tools: questionnaires, direct observations, and oral face-to-face interviews. Teachers were given questionnaires to fill out, students were interviewed orally, and both teachers were observed without their participation.

3.6.1 Observations

The researcher recorded the pertinent data for proper analysis after physically observing the respondents, or the two teachers, while they were participating in CALA activities. According to Best and Khan (2018), an observation is a methodical strategy to data collecting in which researchers employ all of their senses to observe people in their natural environments. This definition implies that observations have advantages and disadvantages as research tools.

Observations, in the opinion of Wandelt (2015), are useful since they give researchers access to the subjects they are studying directly. Instead, of depending on reports or responses from questioning individuals, the researcher actually observes the subject and documents what he or she wants. Direct observation will prevent this drawback in situations when people might need to misrepresent data. Additionally, Leedy (2019) argues that there is more of a provision for a permanent record when observations are made. He contends that a large portion of the physical behavior that is of great interest to the researcher is extremely quick and fleeting. Because all observation involves some type of recording, it gives a permanent record of such occurrences or behavior, making it simple to perform prospective analysis or future comparisons.

Nevertheless, according to Creswell (2014), direct observation is time-consuming and prone to observer bias. This implies that the observer might be persuaded to note occurrences that did not occur, which might afterwards call into question the accuracy and dependability of such observed data. Another potential flaw in observations is the "observer effect," which occurs when the observer's presence alters the behavior of the subjects being observed. As a result, extreme caution was used to make sure that the persons being watched did not conceal their true activities.

3.6.2 Interviews

According to Creswell (2014), an interview is a procedure that involves gathering information from people directly through verbal engagement. Like any research methods, interviews offer benefits and drawbacks. According to Creswell (2014), interviews are appropriate for information gathering even from illiterate respondents since the language of interview items can be adjusted to the literacy level of interviewees. Interviews also prevent respondents from lying about information like age, sex, and race (Phillips and Pugh, 2016; Creswell, 2014). Once more, interviews facilitate the development of relationships between the researcher and respondents because there is a greater requirement for mutual trust when dealing with sensitive information (Popper, 2014). This implies that apart from allowing researchers an immense opportunity for screening, inter-personal relations between the interviewer and interviewees improve tremendously.

Information relating to individual thoughts, feelings, and perceptions was favoured by the researcher. Consequently, a further benefit of oral interviews is that they enable the collection of sensitive information from interviewees (Phillips & Pugh, 2016). As a result, the respondents' responses can be explained and uncertainties can be cleared up in their own words. No one else in the group has any influence on the interviews (Best and Khan, 2018). In this instance, the researcher was able to record details such as the participants' feelings and behaviors directly from them.

Oral interviews can be time-consuming and subjective, especially when dealing with very large populations, and they can also be prejudiced (Phillips and Pugh, 2016). The interviewer must give the respondents enough time to react, use impartial questions, and cease predicting and cueing possible responses. Again, during interviews, if the questions are too in-depth, sensitive, or prolonged, some respondents may become uncomfortable and use avoidance strategies (Creswell, 2014). This drawback was lessened by the interviewer's ability to establish rapport and trust with participants, which allowed for the gathering of data collecting that would not have been possible otherwise. Additionally, according to Borg & Gall (2019), interviews cannot guarantee the respondents' confidentiality. This means that for face to face oral interviews, it is an uphill battle for interviewees to hide their identity as in other instruments like questionnaires. To carry out face-to-face oral interviews on the sample, the researcher arranged to have them in groups of five and spread them in stages over a given period of time.

3.6.3 Questionnaires

A questionnaire, according to Best and Kahn (2018), is a piece of writing with questions intended to elicit data analysis-relevant information. Most individuals are familiar with and can easily interpret questionnaires because almost everyone has completed one at some point (Creswell, 2014). Again, Popper (2014) argues that respondents are generally not alarmed by questionnaires. The majority of the participants were interested in filling out surveys, which was helpful to the researcher. Additionally, because identities of respondents were not listed on the surveys, participants had the most freedom to express their thoughts and opinions (Best and Kahn, 2018). Additionally, the questionnaires were chosen by the researcher since there was no middlemen bias and the questions were consistent for all respondents (Popper, 2014). This suggests that regardless of the number of respondents, they all provided comparable answers, making data analysis simple, quantitative, and amenable to study. The respondents are not influenced by the researcher's personal beliefs when responding to questions, which results in inaccurate data being recorded (Creswell, 2014).

The fact that questionnaires could be customized to each respondent's level was another reason they were chosen. Both closed-ended and open-ended questions were used by the researcher since they are often simple to respond to and give respondents the opportunity to elaborate on their feelings. Best and Kahn (2018) also admit that using questionnaires allows researchers to quickly gather considerable amounts of data from a big population. Additionally, Leedy (2019) agrees that information can be gathered from distant respondents using surveys. As a result, questionnaires can be distributed by email to respondents, who can then reply via the same channel. Contrary to interviews, Popper (2014) contends that questionnaires are simple to develop, create, and administer. Leedy (2019) also posits that questionnaires tend to direct respondents on those aspects the researcher requires, thus avoiding all other irrelevant data. This means that there is no probability of gathering unwanted data, since there are guidelines to be strictly followed.

But when working with respondents who cannot read or write, surveys are not the best way to obtain data because they do not follow up with individuals who provide fascinating, unclear, or incomplete replies (Popper, 2014). This means that sending surveys to respondents who are illiterate would not get the expected results because some of them might not be completed. Additionally, there is a potential that respondents who lack literacy will withhold information by either keeping the questionnaires or destroying them to cover up their lack of reading. The

questionnaires were given to respondents who could read and write, and the researcher pre-tested them to eliminate any potential for bias. As a result, the aforementioned issues were not encountered.

3.7 Data Collection Procedures

As a way of gathering data, the researcher used observations, questionnaires, and oral interviews. The major issue and the sub-research topics served as the foundation for the questionnaires and interview schedules. Learner interview schedules, instructor questionnaires, and an observation guide for both teachers had all been produced. Interview subjects were scheduled to meet with the researcher during their free time. The interviews were captured on a cell phone by the researcher. For use in data analysis in the future, the responses were gathered and recorded. Respondents were informed by the researcher that the results were solely for research reasons and that they should therefore feel completely free to share their opinions. Additionally, a classroom management observation guide was employed by the researcher to capture all of the crucial data.

3.8 Data Presentation, Analysis and Interpretation Plans

In addition to being provided in narrative form and statistical tables, the information acquired through questionnaires given to teachers, interviews with students, and the researcher's own observations was also analyzed and interpreted in accordance with the study's goals. In order to identify discrepancies or parallels, the researcher compared their findings to those from past studies.

3.9.0 Validity and Reliability

According to Phillips and Pugh (2016), the research tools used to gather data must be both genuine and dependable. The methods employed for this study included a mix of direct observations, questionnaires, and in-person oral interviews. May (2016) argues further that the research must yield accurate knowledge while also being reproducible in order for conclusions to be useful. These show reliability and validity, respectively.

3.9.1.1Validity

Popper (2014) defines validity as the extent to which the results of an evaluation procedure serve the particular purpose for which they were intended. Leedy (2015) defines validity as the extent to which an instrument measures what it is designed to measure. The instruments that

were used by the researcher had strengths and weaknesses, and the researcher tirelessly minimized the detrimental effects of the latter. The researcher tried to guard against weaknesses of ambiguity, as well as vague wording. The researcher also resorted to the use of simple language as a way to avoid double-barreled questions.

3.9.1.2 Reliability

Reliability is defined by Best and Kahn (2018) as the degree of integral consistency and measure stability. According to Creswell (2014), dependability is the degree to which the same data would be gathered each time the same phenomena is observed repeatedly. As a result, accuracy and consistency of the measuring tools are important for taking repeated measurements. The researcher self-conducted interviews and made sure that the interview questions linked to the study objectives in order to assure the trustworthiness of the data acquired for this study.

3.9.1.3 Ethical Considerations

Reliability is defined by Best and Kahn (2018) as the degree of integral consistency and measure stability. According to Creswell (2014), dependability is the degree to which the same data would be gathered each time the same phenomena is observed repeatedly. As a result, accuracy and consistency of the measuring tools are important for taking repeated measurements. The researcher self-conducted interviews and made sure that the interview questions linked to the study objectives in order to assure the trustworthiness of the data acquired for this study.

3.9.1.4 Anonymity and Confidentiality

In this study, anonymity and secrecy were both respected. According to Bell (2015), it is not necessary for the researcher to reveal or imply which responses come from participants. By guaranteeing respondents that their replies would only be used in the educational realm, the researcher was able to retain a high level of secrecy. The responders have a great deal of room to express their emotions as a result.

3.9.2 Voluntary Participation

Prior to participating in this study, participants were informed that participation was completely voluntary and that there would be no consequences for people who chose to leave the study early. Given that they chose to participate, the respondents had more opportunity to convey

their true feelings.

3.9.3 Informed Consent

The researcher must disclose the study's purpose, goals, and objectives to the participants in order to obtain their informed permission (Phillips & Pugh, 2016). Additionally, the teachers provided all relevant information regarding the importance of the study to all stakeholders via a consent form that they signed. This inevitably helped the participants give honest and reliable information because they felt respected.

3.10. Summary

The theoretical underpinnings for the practical conduct of the investigation were brought out in this chapter. It took into account the population and sample, the research strategy, and the methods and procedures for sampling. The chapter also examined the advantages and disadvantages of the data collection and research design tools, as well as solutions for the latter. The methods for gathering data, plans for analysing and interpreting the data, ethical concerns, and the accuracy and dependability of research tools were all covered in the chapter's concluding sections. The data gathered from the research field will be presented, examined, and interpreted in the following section, chapter 4.

CHAPTER 4

4.0 DATA PRESENTATION, INTERPRETATION AND ANALYSIS

4.1 Introduction

This chapter focuses on the outcomes or findings gathered through an evaluation test and interviews based on the views of teachers and students on the impacts of CALAs, efficient methods for implementing them, and their drawbacks and benefits in teaching in general and in teaching Mathematics in particular at "O" level. Interviews and a student-written CALA project were used to collect information. Tables, pie charts, and bar graphs were used to present the results of these interviews.

4.2 Demographic Data

The study of a population based on characteristics like age, race, and sex is known as demographic analysis. The term "data" refers to statistically stated socioeconomic information on employment, education, income, marriage rates, birth and death rates, among other things. To understand the characteristics of the sample, the researcher requested demographic data from the respondents. To understand the characteristics of the sample, the researcher requested demographic data from the respondents.

4.3 Gender of the Respondents.

The purpose of the study was to determine the gender distribution of the sample population in order to tabulate the results accordingly. This aided in gathering a range of viewpoints from both men and women regarding the impacts of CALAs on the instruction and retention of mathematics at "O" level. The gender distribution of the study respondents is shown in Table 4.3.1.

Table 4.3.1: Gender Distribution of learner respondents

Sex of learner	Frequency	Percentage
Male	15	32.5%
Female	25	62.5%
Total	40	100%

The information in Table 4.3.1 and Figure 4.3.1 suggests that the researcher worked with 40 students in total, with 15 men (37.5%) and 25 women (62.5%) among those students. This information demonstrates that the researcher's study participants were more often men than women. These statistics also show that at the case study schools the researcher selected, there are more female students than male pupils taking "O" level Mathematics.

Table 4.3.2: Gender distribution of teacher respondents

Sex	Frequency	Percentage
Male	6	60%
Female	4	40%
Total	10	100%

The same data was presented on the pie chart below:

Sexes of teachers
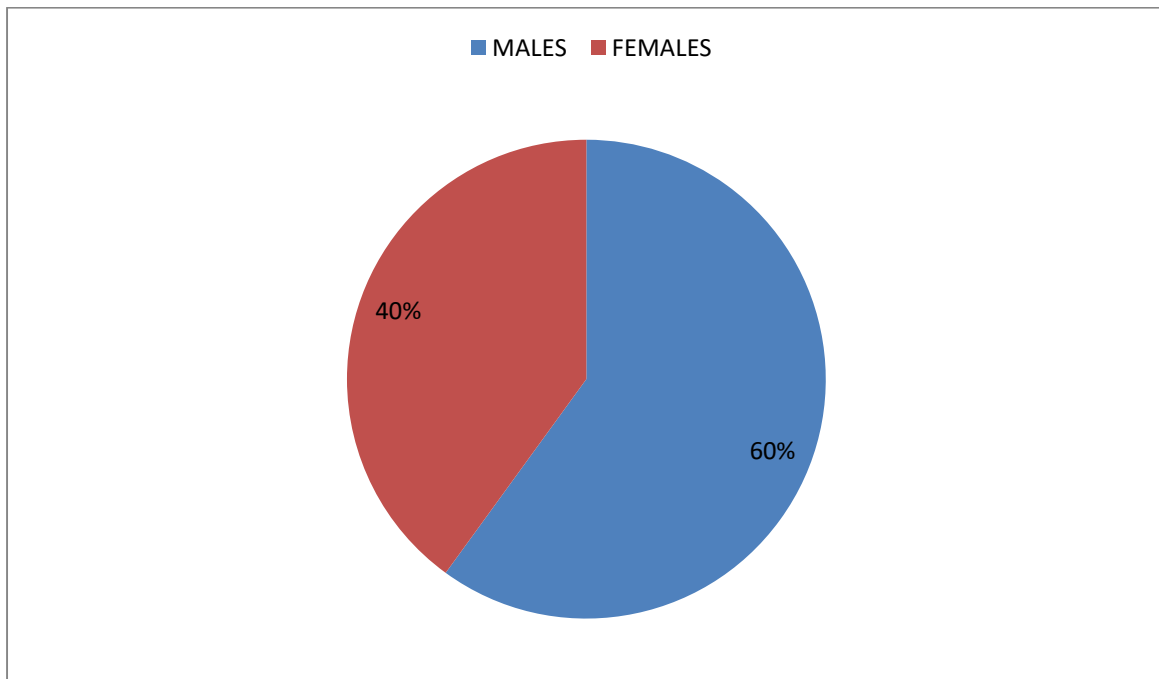
Figure 4.3.2 Showing sexes of teachers

There were six (60%) male teachers and four (40%) female teachers, according to the statistics in Figure 4.3.2. According to the data, there were more male teachers employed than female teachers. However, the data shows that the researcher was successful in gathering information from both male and female respondents about the effect of CALAs in the teaching and learning of mathematics. This also means that in order to strengthen the credibility of the data gathered, the study gathered the opinions of both male and female educators.

4.4.1 Ages of Learners
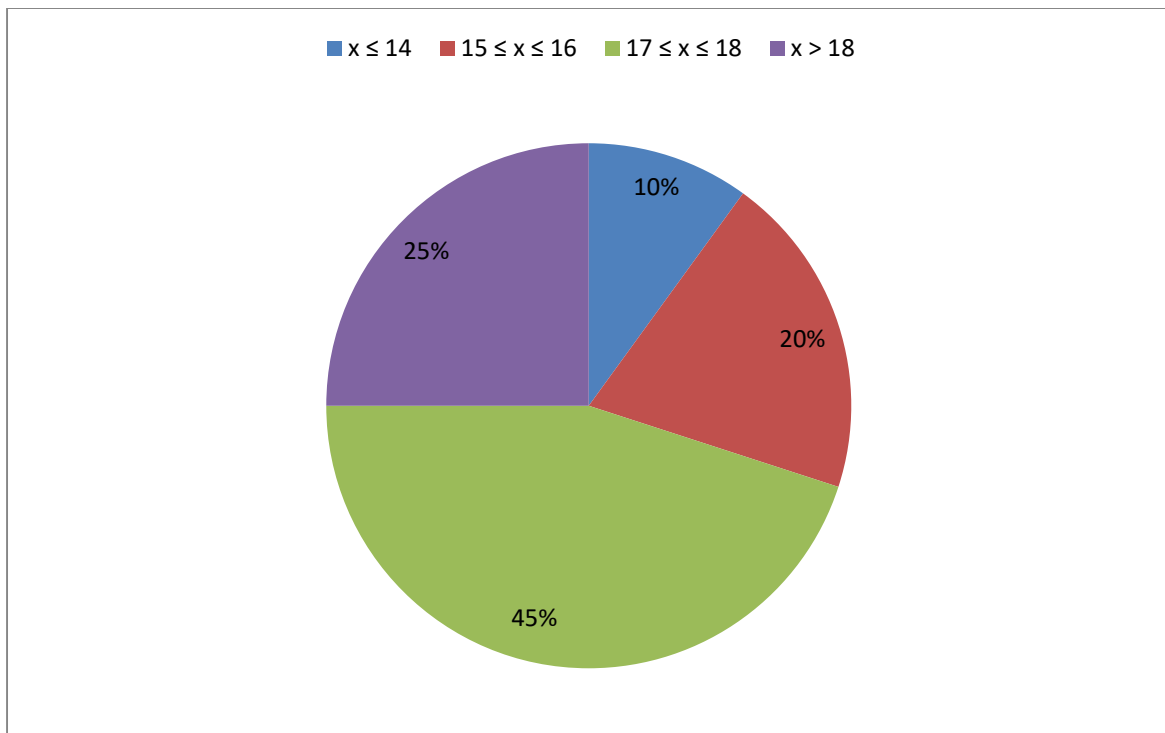
Figure 4.4.1 Pie Chart Showing Ages of Learners

According to the pie chart in Figure 4.4.1, of the 40 students, 4 (10%) were 14 years of age or younger, 8 (20%) were in the range of 15 to 16 years, 18 (45%) were in the range of 17 to 18 years, and 10 students (25%) were over the age of 18. The researcher gathered information from students in various age groups, which improved the validity and trustworthiness of the data they provided. This also implies that the combination of the different age groups served as the ideal sample for gathering opinions from all age groups on the impacts of CALAs on the teaching and learning of mathematics. The many age groups the researcher used in this study also show that the researcher collaborated with students of varying educational backgrounds.

4.4.2 Ages of Teachers
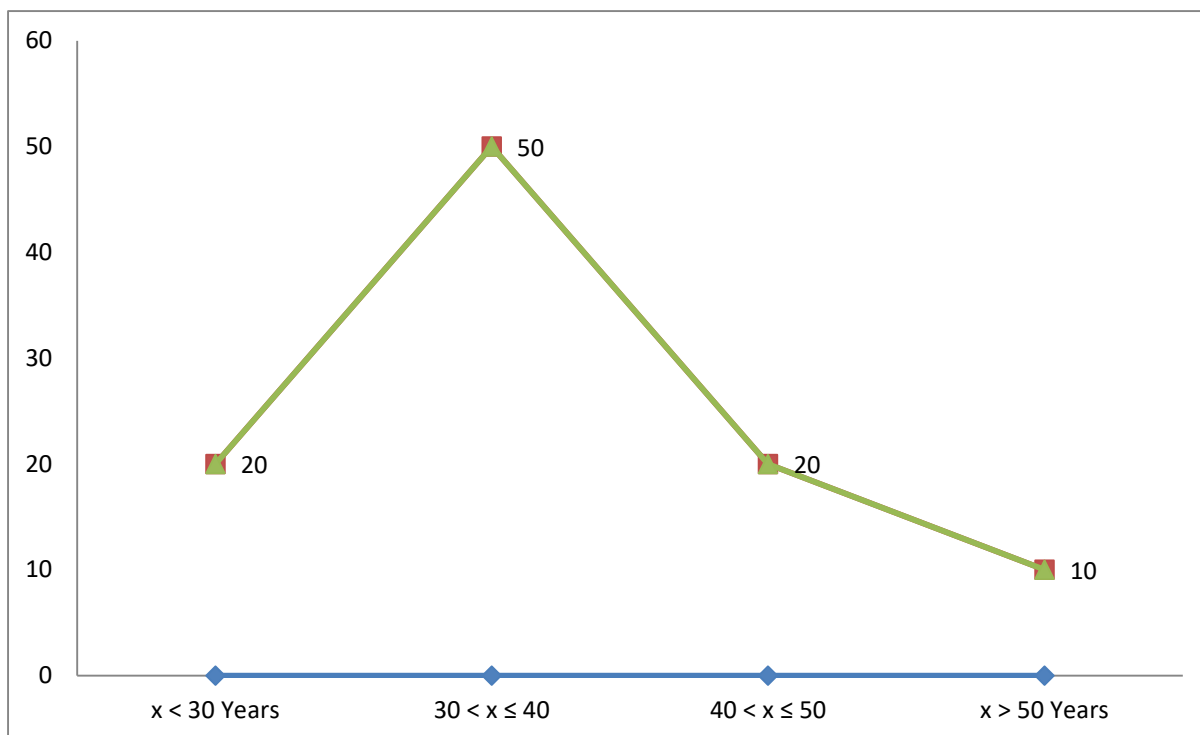
Figure 4.4.2 Line Chart Showing Ages of Teachers

Figure 4.4.2 shows that the researcher worked with 1 teacher (10%) less than 30 years, 5 teachers (50%) between 30 and 40 years, 3 teachers (30%) between 40 and 50 years and only 1 teacher (10%) above 50 years of age. From Figure 4.4.2, it is also clearly shown that majority of the teachers (50%) are between 30 and 40 years, followed by 30% between 40 and 50 years, an indication that more age groups were engaged in the teaching profession. The results also show that the researcher worked with respondents of various ages, giving each age group a chance to express their opinions on how CALAs have affected students in the Marondera District doing "O" level courses, notably in mathematics. As a result, the researchers' findings were given more validity and reliability thanks to the different age groups. The data shown in Figure 4.4.2 above also shows that secondary school teachers are either middle-aged or older, suggesting that the secondary school setting greatly values their elderly attitude.

4.4.3 Teacher Professional qualifications

 4.4.3 Showing Teachers' highest levels of education
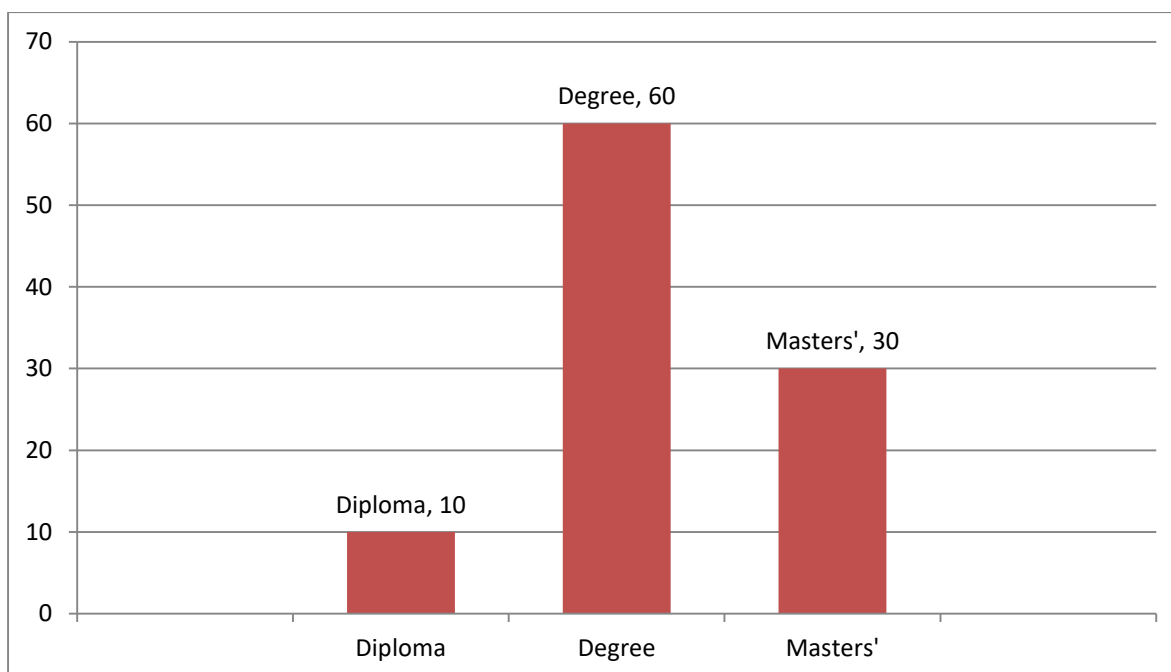
Figure 4.4.3 Pie Chart Showing Teachers' Highest Level of Qualifications

Figure 4.4.3 indicates that of the sampled teachers in Marondera District, no teacher (0%) had no any formal qualification, 1 teacher (10%) had a Diploma in Education, 6 teachers (60%) had Degrees in Education and 3 teachers (30%) had Masters' Degrees in Education. Even though the study was not primarily focused on the qualifications, it was important to highlight that all of the teachers (100%) had the necessary credentials to carry out their duties at the secondary school. The aforementioned information indicates that there was a high possibility of acquiring accurate information on the effects of CALAs in mathematics instruction in the Marondera District, as well as that the respondents were able to reply to the interviews. The same data shows that the majority of secondary school teachers in Zimbabwe are appropriately qualified and aware of the requirements associated with using CALAs in the teaching and learning of mathematics at the "O" level.

4.4.4 ANALYSIS OF RESULTS FROM QUESTIONNAIRES

4.4.4.1 Research Question 1: What are the merits of CALAs in teaching 'O' Level Mathematics?

POSSIBLE MERIT OF CALA	SA	A	U	D	SD
Improve learner participation in the subject	80	7.5	-	10	2.5
Minimizes malpractices during ZIMSEC examinations	-	5	-	90	5
Enables use of school-based marks by ZIMSEC	100	-	-	-	-
Eradicates learner weaknesses	-	7.5	-	85	7.5
Enables teachers to give meaningful feedback	-	5	-	80	15
Includes the teacher in the assessment of learners	100	-	-	-	-
Allows for extension and remediation	-	-	2.5	92.5	5
Enables learners profiling	92.5	-	-	5	2.5

The data in Table 4.4.4.1 indicates that the respondents strongly agreed that CALAs improve learner participation (80%), enables use of school-based marks to complement ZIMSEC assessment (100%), includes the teacher in assessing learners (100%) and enables learner profiling (92.5%). The respondents however disagreed that CALAs minimize exam malpractices (90%), eradicates learner weaknesses (85%), enable teachers to give meaningful feedback (80%) and allows for extension and remediation (92.5%). The opinions of the respondents are similar to those of Tshuma (2021), who agrees that CALAs are important in keeping learners engaged and that they take into account teachers' efforts when evaluating learners at ZIMSEC. Again, teachers disputed the assertions that CALAs eliminate student deficiencies and allow teachers to provide feedback, remediation, and extension since in Zimbabwe, CALAs are not supplied to students after marking because some students would disappear along with the CALAs. Again, because teachers don't talk to their students about the mark guide, student shortcomings remain.

4.4.4.2 Research Question 2: What are the setbacks of using CALAs in 'O' Level Mathematics?

Table 4.4.4.2 Frequency Table showing challenges of using CALAs in teaching and learning of Mathematics

POSSIBLE CHALLENGE OF CALA IMPLEMENTATION	SA	A	U	D	SD
Anxiety and stress of being continuously tested	80	15	-	5	-
Reduced teacher-learner contact time	92.5	-	-	7.5	-
Use of cheap questions that are easy to mark	90	-	-	7.5	2.5
Lack of uniformity of CALAs in Zimbabwe	100	-	-	-	-
Inadequate training of teachers on CALA implantation	-	-	-	92.5	7.5
Lack of moderation, remedial assistance and extension	-	15	-	82.5	2.5
Effects of transfers and the absenteeism	-	5	-	95	-
Effects of over-enrolment	87.5	10	-	2.5	-

Data in Table 4.4.4.2 is reflective that the possible challenges to the implementation of the CALAs are abound. The respondents strongly agreed that CALAs bring anxiety and stress among learners (80%), they reduce teacher learner contact time (92.5%), they lack uniformity across schools (100%), they use easy tasks (90%) and they are heavily militated upon by very large classes (87.5%). The same data is indicative that the respondents disagreed that CALAs are affected by transfers and absenteeism (95%), they lack moderation (82.5 %) and that teachers are not well trained in implementation of the CALAs (92.5). Kadungure (2021), who contends that taking CALAs is stressful, supports the notions that CALAs cause anxiety. Once more, Tshuma (2021) claims that CALAs shorten the amount of time teachers spend with their students and that they differ between schools. Again, the assertion that CALAs lack moderation is at odds with reality in Zimbabwe, where ZIMSEC dispatches moderators across the nation to carry out the moderation. This data demonstrates that CALAs are evolving positively and in line with global expectations.

4.4.4.3 Research Question 3: How do teachers perceive the adoption of CALAs in 'O' Level Mathematics?

Table 4.4.4.3: Showing learner perceptions to CALA adoption in Mathematics teaching and learning.

POSSIBLE PERCEPTION TO ADOPTION CALA	SA	A	U	D	
CALAs are time-consuming	82.5	10	-	7.5	-
CALAs induce uneasiness in learners	97.5	2.5	-	-	-
CALAs are not ideal to struggling economies	92.5	7.5	-	-	-
CALAs require constant monitoring and supervision.	80	7.5	-	10	2.5
CALAs are a burden for teachers	87.5	12.5	-	-	-
CALAs are a burden for learners	100	-	-	-	-

As regards the perceptions to the implementation of CALAs, the respondents strongly agreed that CALAs are time consuming (82.5%), they induce uneasiness in learners (97.5), they are not ideal to struggling nations like Zimbabwe (92.5%), they require constant monitoring and supervision (80%), they are a burden for teachers (87.5%) and they are also a burden for learners (100%). This data is indicative that the respondents supported all the ideas on the Likert scale. That CALAs are time consuming is a reflection of Moyo (2021), who opines that CALAs have a major challenge that they gobble much of the time that can be slotted for meaningful learning. Again, Kadungure (2021) agrees with the teachers' thoughts when he claims that CALAs make students anxious since they make them nervous when they miss the deadlines. The participants also stated that CALAs are a burden for teachers, which is in line with Chakanyuka's (2017) assertion that teachers must have an entrepreneurial mindset in order to completely implement CALAs. Furthermore, the respondents' assertion that CALAs are not possible in emerging and undeveloped countries implies that teachers who implement CALAs should have access to sufficient resources and even be paid in order to ensure that its implementation is successful.

4.4.4.4 Research Question 4: What techniques can be adopted to instill positive perceptions of CALAs by teachers in 'O' Level Mathematics?

Table 4.4.4.4 Showing possible intervention strategies to improve the use of CALAs in teaching and learning of Mathematics at 'O' level

POSSIBLE INTERVENTION STRATEGY (%)	SA	A	U	D	SD
Reorganizing assessment modes	5	7.5	72.5	-	15
Proper administration of times and CALA times	87.5	12.5	-	-	-
Redesigning content for CALAs	-	5	80	-	15
Moderation of CALAs	90	-	-	10	-
Reduce number of CALA assessments	100	-	-	-	-
Maintaining recommended teacher-pupil ratios	92.5	-	5	2.5	-
Putting much emphasis on research work	-	-	97.5	2.5	-
Avail teacher training workshops for mathematics teachers	97.5	2.5	-	-	-
Encouraging corrections after each CALA activities	-	-	95	5	-

As regards the possible mechanisms that can be implemented to improve the use of CALAs, data in Table 4.4.4.4 reflects that the teachers strongly agreed that proper administration of CALAs (87.5%), CALA moderations (90%), reduction of CALA components (100%), maintaining teacher-learner ratio (92.5%), as well having workshops for the implementers (97.5%) were viable techniques of improving the use of CALAs in teaching and learning of Mathematics at 'O' level. Regarding the other intervention techniques, the respondents lacked consensus. This data shows that if CALAs are properly managed (Mpofu, 2019), moderated in accordance with established norms (Chakanyuka, 2017), and conducted with courses that have an acceptable enrolment, they will produce the desired effects. The information in Fig. 4.4.4.4 also shows that respondents had mixed feelings about CALAs emphasizing research work heavily in order to develop their analytic and research skills.

4.5 Analysis of interviews with teachers

4.5.1 Objective 1: To outline the merits of using CALAs in teaching and learning of Mathematics

The goal of the study was to determine whether using CALAs in the teaching of "O" level mathematics was beneficial for both teaching and learning the subject. The information gathered showed that while one group of instructors opposed the usage of CALA, another group of teachers supported it. The information acquired showed that CALAs were helpful in enhancing learner profiling, removing learners' shortcomings, enabling teachers to provide feedback on the learners' progress, and improving teachers' teaching and learning methods. In addition, the teachers mentioned that the CALAs were intended to aid in the results of summative assessments, prepare students for key exams, and prepare them for their future employment. The findings on CALAs' use for career preparation echoes the sentiments of Mpofu (2019), who avers that CALAs can be used to gauge learners' future skills.

4.5.2 Objective 2: To outline the challenges of using CALAs in teaching Mathematics at 'O' level

The teachers were open and honest when discussing the obstacles preventing the effective implementation of CALAs in the teaching and learning of mathematics at the "O" level. They stated that the CALA system had some shortcomings that needed to be fixed in order for their implementation to take place and produce beneficial outcomes. The majority of the instructors agreed that CALAs were time-consuming, difficult for them to implement, non-standardized, and reduced the amount of time that teachers and students interacted. Again, some of the teachers admitted that there were too many CALAs for students, which is in line with ARTUZ's assessment (2021). This indicates that these educators desired a decrease in the number of CALAs. Again, it became clear from the teacher interviews that CALAs were not being remedied; they continued to cause anxiety in students, made them vulnerable to unforeseen events, and were impacted by the big classrooms that are common in most secondary schools in Zimbabwe. A small number of teachers, 30% of them expressed regret that the type of CALAs that were commonly used in schools ignored research work and created conflicts of interest because they were frequently completed at the last minute and teachers hurried to find students. The conclusion that CALAs lead to conflicts of interest reflects Tshuma's (2021) observation that the time when CALAs are filed is chaotic because teachers are searching for candidates without CALAs.

4.5.3 Objective 3: To determine perceptions of teachers towards CALAs

The purpose of the study was to determine how teachers felt about the adoption of CALAs at "O" level. The majority of respondents said that while CALAs were a necessary component of implementing the competency-based curriculum, they were time-consuming and added to the workload for both teachers and learners. This indicates that because CALAs didn't have a designated time slot on the timetable, they took up a lot of time that could have been spent learning the material. Some of the respondents also stated that it was highly likely that CALAs will add to the already heavy workloads of the underpaid instructors because of the poor compensation packages received by teachers, who implement CALAs. Some participants were also of the opinion that teachers perceived the implementation of CALAs as a ploy by the authorities to silence teachers and occupy participants, by creating more work for them.

4.5.4 Objective 4: To establish how CALAs can be effectively implemented in the teaching and learning of Mathematics at 'O' level.

The study also looked at ways to enhance CALAs in mathematics education, namely in teaching and learning mathematics. If the CALA system is to be used to the benefit of students, the teachers emphasized that effective monitoring and evaluation are required. Again, 80% of the instructors said that in order for the CALAs to be implemented successfully, there needed to be comprehensive moderation in every school, a reduction in the amount of CALA assessment assignments, and maintenance of the regular teacher-student ratios. Chakanyuka (2017), who criticizes the few schools that are moderated at the expense of the entire candidature, underlined the need for CALAs to be moderated for their effective implementation. Another group of teachers, 60%, also stated that schools were supposed to maintain standard teacher-pupil ratios train their teachers on CALA implementation and also encourage teachers to revise CALA tasks with learners to sharpen their skills and prepare them for examinations.

4.6 Analysis of Data from Observations

4.6.1 OBJECTIVE 1: To examine the strengths of implementing CALAs in the teaching and learning of 'O' level Mathematics.

4.6.1.1 Teachers giving feedback after CALA administration

The researcher saw that once they had been marked, CALAs weren't provided to the students. The researcher remarked that the teacher didn't have time to grade the scripts and provide comments to the students because of the pressure of the CALA submission. This suggests that CALAs were not being given back to the students to check their scores. When questioned about this occurrence, the educators maintained their position and claimed that the students who received their CALAs back either refused to transmit them for filing purposes or did so reluctantly. Once more, the researcher observed that after CALA administration, no remedial or extension work was issued in addition to returning comments to the students, which runs counter to Madziyire's claims (2015). The researcher noted that most of the learners scored very high marks and hence there was no need for offering remediation, save for a few learners who were not time conscious.

4.6.2 OBJECTIVE 2: To examine the weaknesses of CALAs in the teaching of 'O' level Mathematics

4.6.2.1 Competition for CALA attention by all learning areas and sizes of classes versus CALA administration

The researcher also noticed that CALAs were completed quickly and that students were not given enough time to focus on their academic work. This means that, especially during the week when CALAs were declared due, there wasn't enough time to apply the CALAs. Mangwaya (2021) asserts that CALAs are regarded as time-consuming, particularly when they must be completed by a certain date. The researcher also noticed that several of the schools had unusually large class sizes, making it difficult for some teachers to mark papers and compile grades. The presence of big courses, where teachers took the entire stream, was adverse to the calibre of CALAs produced. Some CALAs were just hurried through to legitimize the procedure.

4.6.3 OBJECTIVE 3: To determine perceptions of both learners and educators towards CALAs in 'O' Level Mathematics.

4.6.3.1 Feasibility of carrying out CALAs in Zimbabwean schools

The researcher saw that both teachers in Zimbabwe were burdened by the manner CALAs were being implemented because they had so few resources available to them. These findings are consistent with ARTUZ's (2015) conclusion that CALAs were not practical in developing nations whose economies were suffering from resource shortages.

4.6.3.2 Extent to which teachers institute monitoring and supervision

The researcher found that although CALA monitoring and supervision were widely practiced in the studied schools, instructors were not all that totally engaged in the process and complained of receiving inadequate compensation. These observations are similar to those made by Tshuma (2021), who bemoaned the fact that students participating in CALAs are not being watched over or monitored by teachers. The researcher's observations also suggested that carrying out the CALAs would be difficult in the absence of tight oversight and monitoring.

4.6.4 OBJECTIVE 4: Highlight ways of fostering positive perceptions towards CALAs in both learners and educators in 'O' Level Mathematics.

4.6.4.1 Quantities of CALAs administered on each learner

The study also noted that when compared to the deadlines set to students, the quantities of CALAs that each learner in mathematics was obliged to produce were too much to handle. This finding is similar to those of Kwami (2021), who believed that the five CALA components for "O" level students were just intolerable since they would absorb the precious.

4.6.4.2 Do learners carry out corrections after CALAs have been marked?

Examining the CALAs that were marked indicated that there were no instances of corrections being made because the students hardly ever received their CALAs to make corrections. Again, the researcher saw that there were no opportunities for the learners to review the CALAs with them or receive the CALA mark to facilitate independent study and exam preparation. Quansah (2018) claims that CALAs can be utilized to eliminate student errors and therefore help students study for tests, while Tayananiswa (2021) asserts that the scenario in Zimbabwe did not adhere to such a statute on CALA implementation.

4.7 Summary

This chapter presented the data obtained by the researcher on frequency distribution tables, pie charts and bar charts. Thereafter, the data was analyzed and interpreted in the light of research objectives. Chapter 5 caps the whole study.

CHAPTER 5

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The chapter gives the summary of the whole study, the conclusions deduced by the researcher using the data obtained, and the recommendations proposed basing on the researcher's findings. Finally, the researcher gives research questions generated by this study and the overall conclusion.

5.2 SUMMARY OF THE WHOLE STUDY

This study was carried out in Marondera District, Mashonaland East Province. It was completed in 2022, and the main purpose of carrying out this study was to examine the effects of using CALAs in teaching and learning of 'O' level Mathematics in Marondera District. The study involved 50 participants, among them 10 teachers and 40 learners. In the second chapter, references to relevant literature were made, and many authorities who were consulted discussed various elements of the value of continuous assessment in the teaching and learning of mathematics at "O" level. The literature examined the benefits of CALAs in mathematics teaching and learning, the difficulties connected with their usage, as well as the various mechanisms that could be put in place to enhance the application of CALAs in mathematics teaching and learning at the secondary school level.

The researcher opted to use a qualitative descriptive survey research design to gather data for this study. Oral interviews were a crucial component of the research design that the researcher employed to collect data for analysis. While students were taking the CALA test for evaluation, teachers participated in oral interviews.

Pie charts, bar graphs, and frequency tables were used to display the information that was gathered through questionnaires, oral interviews, and direct observation. The researcher's data revealed that despite the evident difficulties encountered in integrating CALAs into teaching and learning in Marondera District, they were indeed useful to both teachers there. The study also identified a number of challenges to the efficient application of CALAs for both teachers and students. Other than a lack of resources and time to adequately meet with participants in order to collect data for the study, the researcher faced no significant obstacles in his efforts to obtain data for this study. Once more, the COVID-19 epidemic prevented the researcher from using a broader sample with participants from institutions other than the case study schools used in this study. Despite the small sample size, the researcher used judgment while choosing the data for the study to reduce bias and assure generalizability.

5.3 FINDINGS AND CONCLUSIONS

5.3.1 Objective 1: To outline the merits of using CALAs in teaching and learning of Mathematics

The goal of the study was to determine whether using CALAs in the teaching of "O" level mathematics was beneficial for both teaching and learning the subject. The information acquired showed that CALAs were crucial in enhancing learner profiling, eliminating learners' deficiencies, enabling teachers to provide feedback on the learners' progress, and improving teachers' teaching and learning methods. In addition, the teachers mentioned that the CALAs were intended to aid in the results of summative assessments, prepare students for key exams, and prepare them for their future employment. Therefore, it was recommended by the data gathered from the respondents that CALAs may be utilized to evaluate learners' future competencies.

5.3.2 Objective 2: To outline the challenges of using CALAs in teaching Mathematics at 'O' level

The results showed that CALAs were time-consuming, a burden for instructors, not standardized and uniform, and they reduced teacher-learner interaction time. These issues make it difficult to adopt CALAs in the teaching and learning of mathematics at the "O" level. This indicates that these educators desired a decrease in the number of CALAs. Again, it became clear from the interviews with teachers that CALAs were not being remedied, that they caused ongoing anxiety in students, that they were vulnerable to unforeseen events, that they were impacted by the large classes common in most secondary schools in Zimbabwe, that they created conflicts of interest because they were frequently completed at the last minute and teachers scrambled to find students, and that the type of CALAs that were common in schools overlooked research work.

5.3.3 Objective 3: To determine perceptions of teachers towards CALAs in teaching and learning of 'O' level Mathematics.

The researcher saw that the majority of teachers in Zimbabwe were burdened by the manner in which CALAs were implemented because of limited resources and no time allocated specifically for them.

5.3.4 Objective 4: To establish how CALAs can be effectively implemented in the teaching and learning of Mathematics at 'O' level.

The study also intended to identify the best ways to use CALAs to enhance math instruction and learning. If the CALA system is to be used to the benefit of students, the respondents answered that effective monitoring and evaluation are required. Again, the respondents said that in order for the CALAs to be effectively implemented, it was necessary to: execute complete moderation in all schools, decrease the quantity of CALA assessment assignments, and preserve standard teacher ratios. Another set of respondents agreed that schools should uphold the recommended teacher-to-student ratios, train their staff on CALA implementation, and urge teachers to go over CALA activities with students to help them hone their skills and get ready for tests.

5.4 RECOMMENDATIONS

5.4.1 The Curriculum Development and Technical Services (CDTS) shall work to administer CALAs correctly in order to maintain consistency and high standards throughout all schools.

5.4.2 To prevent disadvantageing students, CALAs should be moderated throughout all schools, not just a select group of them.

5.4.3 Because CALAs tend to boost student performance, the Zimbabwean government should fairly compensate teachers so that they do not see the additional work of administering CALAs as a burden.

5.4.4 ZIMSEC and the CDTS should begin comprehensive teacher training programs so that all implementers are aware of what to expect from the proper application of CALAs in the teaching and learning of science disciplines like mathematics.

5.4.5 To make sure that learning time is not lost, CALA actioning time should be allotted on the schedule.

5.4.6 To prevent completion delays, CALAs should be begun while learners are healthy in Form 3.

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APPENDIX

1.0. RESEARCH INSTRUMENTS

1.1. Questionnaire for Learners

My name is Chikati Chikati, a student at Bindura University of Science Education (BUSE) studying for a Bachelor of Science Honors Degree in Mathematics Education. I am carrying out a study to establish perceptions of teachers towards implementation of continuous assessment learning activities (CALAs) in teaching and learning of mathematics at 'O' level in Marondera district, MASHONALAND EAST province. Please assist me by completing this questionnaire. The information that you provide will be used for academic purposes only. Please do not write your name or any identification particulars.

Section A: Tick as appropriate.

1. **Sex**: Male

   Female

2. **Age**: ………………………………………..

Section B: RESEARCH QUESTIONS

1. **What are the merits of CALAs in 'O' Level Mathematics?**

POSSIBLE MERIT OF CALA	SA	A	U	D	SD
Boost learner engagement					
minimizes cheating on ZIMSEC exams and					
minimizes cheating on ZIMSEC exams and					
removes a learner's weaknesses					
enables teachers to provide insightful feedback and					
enables teachers to provide insightful feedback and					
enables learners to be profiled;					

Key: SA – Strongly Agree; A- Agree; U – Undecided; D – Disagree; SD – Strongly Disagree

OTHER (SPECIFY)

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2. **What are the setbacks of CALAs in 'O' Level Mathematics?**

POSSIBLE CHALLENGE OF CALA IMPLEMENTATION	SA	A	U	D	SD
tension and anxiety from constant testing					
shorter teacher-student interactions					
Use of affordable, straightforward test questions					
Inconsistency of CALAs in Zimbabwe					
inadequate teacher training for the implementation of CALA					
Absence of moderation, correction, and extension					
transfers' effects and absenteeism					
impact of excessive enrollment					

Key: SA – Strongly Agree; A- Agree; U – Undecided; D – Disagree; SD – Strongly Disagrees

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3. **How do teachers perceive the adoption of CALAs in 'O' Level Mathematics?**

POSSIBLE PERCEPTION TO ADOPTION CALA	SA	A	U	D	

	SA	A	U	D	SD
CALAs take a lot of time.					
CALAs make students uncomfortable					
CALAs are not the best solution for ailing economies.					
CALAs require ongoing supervision and monitoring.					
Teachers have a burden with CALAs.					
CALAs are a hassle for students.					

Key: SA – Strongly Agree; A- Agree; U – Undecided; D – Disagree; SD – Strongly Disagree

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4. **What techniques can be adopted to instill positive perceptions of CALAs by teachers in 'O' Level Mathematics?**

POSSIBLE INTERVENTION STRATEGY	SA	A	U	D	SD
rearranging the modes of assessment					

management of timings and CAL times correctly					
content redesign for CALAs					
Keeping CALAs in check					
Reduce the amount of CALA evaluations					
keeping approved teacher-to-student ratios					
placing a strong emphasis on research					
Take advantage of workshops for teacher education					
promoting adjustments following each CALA activity					

Key: SA – Strongly Agree; A- Agree; U – Undecided; D – Disagree; SD – Strongly Disagree

OTHER (SPECIFY)

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2. INTERVIEW GUIDE

A. INTRODUCTION

My name is Chikati Chikati, a student at Bindura University of Science Education (BUSE) studying for a Bachelor of Science Honors Degree in Mathematics Education. I am carrying out a study to establish perceptions of teachers towards implementation of continuous assessment learning activities (CALAs) in teaching and learning of mathematics at 'O' level in Marondera district, MASHONALAND EAST province. Please assist me by responding and discussing the following questions. The information that you provide will be used for academic purposes only.

B. QUESTIONS FOR INTERVIEW

1. What are the merits of CALAs in 'O' Level Mathematics?

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2. What are the setbacks of CALAs in 'O' Level Mathematics?

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3. How do teachers perceive the adoption of CALAs in 'O' Level Mathematics?

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4. **What techniques can be adopted to instill positive perceptions of CALAs by teachers in 'O' Level Mathematics?**

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3.OBSERVATION GUDE

ASPECTS TO BE OBSERVED

OBJECTIVE 1: To examine the strengths and weaknesses of implementing CALAs in the teaching and learning of 'O' level Mathematics.

5   Teachers giving feedback after CALA administration

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6   Issuing of remedial and extension work after CALA administration

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7   Competition for CALA attention by all learning areas

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8   Sizes of classes versus CALA administration

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OBJECTIVE2: To determine perceptions of both learners and educators towards CALAs in 'O' Level Mathematics.

9   Are there any signs of its time-consuming nature?

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10   Feasibility of carrying out CALAs in Zimbabwean schools

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11   Is CALA burdensome for teachers?

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12   Extent to which teachers institute monitoring and supervision

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OBJECTIVE 3: Highlight ways of fostering positive perceptions towards CALAs in both learners and educators in 'O' Level Mathematics.

1. Quantities of CALAs administered on each learner

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2. Do learners carry out corrections after CALAs have been marked?

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3. Is the nature of CALAs associated with research work?

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4. Are teachers adequately trained to implement CALAs in mathematics?

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